

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/22096

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H03F 1/02, 21/00, 3/45, 3/16; H03I 5/00  
US CL : 330/9, 11, 252, 253, 257, 300; 327/307

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 330/9, 11, 252, 253, 257, 300; 327/307

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
**NONE**

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
**EAST, PLUS SEARCH**

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,160,450 A (ESCHAUZIER et al) 12 December 2000, see entire document.	1, 3, 6, 7, 9
A	US 6,016,067 A (VULIH et al) 18 January 2000 (18.01.2000), entire document.	1-9
A	US 5,994,927 A (NAITO et al) 30 November 1999 (30.11.1999), entire document.	1-9
A	US 5,886,581 A (HUGEL et al.) 23 March 1999 (23.03.1999), entire document.	1-9
A	US 6,037,832 A (KAMINISHI) 14 March 2000 (14.03.2000), entire document.	1-9
A	US 4,990,803 A (GILBERT) 05 February 1991 (05.02.1991), entire document.	1-9
A	US 5,610,547 A (KOYAMA et al) 11 March 1997 (11.03.1997), entire document.	1-9

Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

24 February 2003 (24.02.2003)

Date of mailing of the international search report

**10APR 2003**

Name and mailing address of the ISA/US

Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Faxsimile No. (703)305-3230

Authorized officer

*Shawn S. Kappé*

Patricia Nguyen

Telephone No. (703) 308-1927